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USA

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Certificate Information

The following Ada implementation was tested and determined to pass ACVC 1.11. Testing was completed on 19 March 1992.

Compiler Name and Version: TLD MV/MV Ada Compiler System, Version 2.9.0

Host Computer System: Data General MV/32 20000-2, under AOS/VS II, Version 2.03

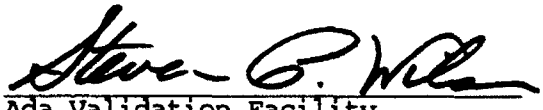
Target Computer System: Data General MV/32 20000-2, under AOS/VS II, Version 2.03

Customer Agreement Number: 91-11-14-TLD

See section 3.1 for any additional information about the testing environment.

As a result of this validation effort, Validation Certificate 920319W1.11238 is awarded to TLD Systems, Ltd. This certificate expires on 1 June 1993.

This report has been reviewed and is approved.



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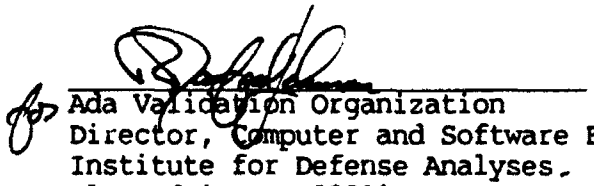
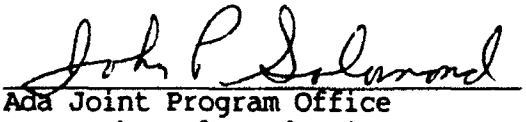


Ada Validation Organization
Director, Computer and Software Engineering Division
Institute for Defense Analyses
Alexandria VA 22311



Ada Joint Program Office
Dr. John Solomond, Director
Department of Defense
Washington DC 20301

AVF Control Number: AVF-VSR-523-0392
30 April 1992
91-11-14-TLD

Ada COMPILER
VALIDATION SUMMARY REPORT:
Certificate Number: 920319W1.11238
TLD Systems, Ltd.
TLD MV/MV Ada Compiler System, Version 2.9.0
Data General MV/32 20000-2 under AOS/VS II, Version 2.03 =>
Data General MV/32 20000-2 under AOS/VS II, Version 2.03

Prepared By:
Ada Validation Facility
ASD/SCEL
Wright-Patterson AFB OH 45433-6503

DECLARATION OF CONFORMANCE

Customer: TLD Systems, Ltd.

Ada Validation Facility: ASD/SCEL, Wright-Patterson AFB, OH 45433-6503

ACVC Version: 1.11

Ada Implementation:

Compiler Name and Version: TLD MV/MV Ada Compiler System, Version 2.9.0

Host Computer System: Data General MV/32 20000-2,
AOS/VS II, Version 2.03

Target Computer System: Data General MV/32 20000-2,
AOS/VS II, Version 2.03

Customer's Declaration

I, the undersigned, representing TLD Systems, Ltd., declare that TLD Systems, Ltd. has no knowledge of deliberate deviations from the Ada Language Standard ANSI/MIL-STD-1815A in the implementation listed in this declaration executing in the default mode. The certificates shall be awarded in TLD Systems, Ltd.'s corporate name.

Date: 29 November 1991

TLD Systems, Ltd.
Terry L. Dunbar, President

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CHAPTER 1

INTRODUCTION

The Ada implementation described above was tested according to the Ada Validation Procedures [Pro90] against the Ada Standard [Ada83] using the current Ada Compiler Validation Capability (ACVC). This Validation Summary Report (VSR) gives an account of the testing of this Ada implementation. For any technical terms used in this report, the reader is referred to [Pro90]. A detailed description of the ACVC may be found in the current ACVC User's Guide [UG89].

1.1 USE OF THIS VALIDATION SUMMARY REPORT

Consistent with the national laws of the originating country, the Ada Certification Body may make full and free public disclosure of this report. In the United States, this is provided in accordance with the "Freedom of Information Act" (5 U.S.C. #552). The results of this validation apply only to the computers, operating systems, and compiler versions identified in this report.

The organizations represented on the signature page of this report do not represent or warrant that all statements set forth in this report are accurate and complete, or that the subject implementation has no nonconformities to the Ada Standard other than those presented. Copies of this report are available to the public from the AVF which performed this validation or from:

National Technical Information Service
5285 Port Royal Road
Springfield VA 22161

Questions regarding this report or the validation test results should be directed to the AVF which performed this validation or to:

Ada Validation Organization
Computer and Software Engineering Division
Institute for Defense Analyses
1801 North Beauregard Street
Alexandria VA 22311-1772

1.2 REFERENCES

[Ada83] Reference Manual for the Ada Programming Language, ANSI/MIL-STD-1815A, February 1983 and ISO 8652-1987.

[Pro90] Ada Compiler Validation Procedures, Version 2.1, Ada Joint Program Office, August 1990.

[UG89] Ada Compiler Validation Capability User's Guide, 21 June 1989.

1.3 ACVC TEST CLASSES

Compliance of Ada implementations is tested by means of the ACVC. The ACVC contains a collection of test programs structured into six test classes: A, B, C, D, E, and L. The first letter of a test name identifies the class to which it belongs. Class A, C, D, and E tests are executable. Class B and class L tests are expected to produce errors at compile time and link time, respectively.

The executable tests are written in a self-checking manner and produce a PASSED, FAILED, or NOT APPLICABLE message indicating the result when they are executed. Three Ada library units, the packages REPORT and SPPRT13, and the procedure CHECK_FILE are used for this purpose. The package REPORT also provides a set of identity functions used to defeat some compiler optimizations allowed by the Ada Standard that would circumvent a test objective. The package SPPRT13 is used by many tests for Chapter 13 of the Ada Standard. The procedure CHECK_FILE is used to check the contents of text files written by some of the Class C tests for Chapter 14 of the Ada Standard. The operation of REPORT and CHECK_FILE is checked by a set of executable tests. If these units are not operating correctly, validation testing is discontinued.

Class B tests check that a compiler detects illegal language usage. Class B tests are not executable. Each test in this class is compiled and the resulting compilation listing is examined to verify that all violations of the Ada Standard are detected. Some of the class B tests contain legal Ada code which must not be flagged illegal by the compiler. This behavior is also verified.

Class L tests check that an Ada implementation correctly detects violation of the Ada Standard involving multiple, separately compiled units. Errors are expected at link time, and execution is attempted.

In some tests of the ACVC, certain macro strings have to be replaced by implementation-specific values — for example, the largest integer. A list of the values used for this implementation is provided in Appendix A. In addition to these anticipated test modifications, additional changes may be required to remove unforeseen conflicts between the tests and implementation-dependent characteristics. The modifications required for this implementation are described in section 2.3.

For each Ada implementation, a customized test suite is produced by the AVF. This customization consists of making the modifications described in the preceding paragraph, removing withdrawn tests (see section 2.1), and possibly removing some inapplicable tests (see section 2.2 and [UG89]).

In order to pass an ACVC an Ada implementation must process each test of the customized test suite according to the Ada Standard.

1.4 DEFINITION OF TERMS

Ada Compiler — The software and any needed hardware that have to be added to a given host and target computer system to allow transformation of Ada programs into executable form and execution thereof.

Ada Compiler Validation Capability (ACVC) — The means for testing compliance of Ada implementations, consisting of the test suite, the support programs, the ACVC user's guide and the template for the validation summary report.

Ada Implementation — An Ada compiler with its host computer system and its target computer system.

Ada Joint Program Office (AJPO) — The part of the certification body which provides policy and guidance for the Ada certification system.

Ada Validation Facility (AVF) — The part of the certification body which carries out the procedures required to establish the compliance of an Ada implementation.

Ada Validation Organization (AVO) — The part of the certification body that provides technical guidance for operations of the Ada certification system.

Compliance of an Ada Implementation — The ability of the implementation to pass an ACVC version.

Computer System — A functional unit, consisting of one or more computers and associated software, that uses common storage for all or part of a program and also for all or part of the data necessary for the execution of the program; executes user-written or user-designated programs; performs user-designated data manipulation, including arithmetic operations and logic operations; and that can execute programs that modify themselves during execution. A computer system may be a stand-alone unit or may consist of several inter-connected units.

Conformity	Fulfillment by a product, process, or service of all requirements specified.
Customer	An individual or corporate entity who enters into an agreement with an AVF which specifies the terms and conditions for AVF services (of any kind) to be performed.
Declaration of Conformance	A formal statement from a customer assuring that conformity is realized or attainable on the Ada implementation for which validation status is realized.
Host Computer System	A computer system where Ada source programs are transformed into executable form.
Inapplicable test	A test that contains one or more test objectives found to be irrelevant for the given Ada implementation.
ISO	International Organization for Standardization.
LRM	The Ada standard, or Language Reference Manual, published as ANSI/MIL-STD-1815A-1983 and ISO 8652-1987. Citations from the LRM take the form "<section>.<subsection>:<paragraph>."
Operating System	Software that controls the execution of programs and that provides services such as resource allocation, scheduling, input/output control, and data management. Usually, operating systems are predominantly software, but partial or complete hardware implementations are possible.
Target Computer System	A computer system where the executable form of Ada programs are executed.
Validated Ada Compiler	The compiler of a validated Ada implementation.
Validated Ada Implementation	An Ada implementation that has been validated successfully either by AVF testing or by registration [Pro90].
Validation	The process of checking the conformity of an Ada compiler to the Ada programming language and of issuing a certificate for this implementation.
Withdrawn test	A test found to be incorrect and not used in conformity testing. A test may be incorrect because it has an invalid test objective, fails to meet its test objective, or contains erroneous or illegal use of the Ada programming language.

CHAPTER 2

IMPLEMENTATION DEPENDENCIES

2.1 WITHDRAWN TESTS

The following tests have been withdrawn by the AVO. The rationale for withdrawing each test is available from either the AVO or the AVF. The publication date for this list of withdrawn tests is 2 August 1991.

E28005C	B28006C	C32203A	C34006D	C35508I	C35508J
C35508M	C35508N	C35702A	C35702B	B41308B	C43004A
C45114A	C45346A	C45612A	C45612B	C45612C	C45651A
C46022A	B49008A	B49008B	A74006A	C74308A	B83022B
B83022H	B83025B	B83025D	C83026A	B83026B	C83041A
B85001L	C86001F	C94021A	C97116A	C98003B	BA2011A
CB7001A	CB7001B	CB7004A	CC1223A	BC1226A	CC1226B
BC3009B	BD1B02B	BD1B06A	AD1B08A	BD2A02A	CD2A21E
CD2A23E	CD2A32A	CD2A41A	CD2A41E	CD2A87A	CD2B15C
BD3006A	BD4008A	CD4022A	CD4022D	CD4024B	CD4024C
CD4024D	CD4031A	CD4051D	CD5111A	CD7004C	ED7005D
CD7005E	AD7006A	CD7006E	AD7201A	AD7201E	CD7204B
AD7206A	BD8002A	BD8004C	CD9005A	CD9005B	CDA201E
CE2107I	CE2117A	CE2117B	CE2119B	CE2205B	CE2405A
CE3111C	CE3116A	CE3118A	CE3411B	CE3412B	CE3607B
CE3607C	CE3607D	CE3812A	CE3814A	CE3902B	

2.2 INAPPLICABLE TESTS

A test is inapplicable if it contains test objectives which are irrelevant for a given Ada implementation. Reasons for a test's inapplicability may be supported by documents issued by the ISO and the AJPO known as Ada Commentaries and commonly referenced in the format AI-ddddd. For this implementation, the following tests were determined to be inapplicable for the reasons indicated; references to Ada Commentaries are included as appropriate.

The following 201 tests have floating-point type declarations requiring more digits than SYSTEM.MAX_DIGITS:

C24113L..Y (14 tests)	C35705L..Y (14 tests)
C35706L..Y (14 tests)	C35707L..Y (14 tests)
C35708L..Y (14 tests)	C35802L..Z (15 tests)
C45241L..Y (14 tests)	C45321L..Y (14 tests)
C45421L..Y (14 tests)	C45521L..Z (15 tests)
C45524L..Z (15 tests)	C45621L..Z (15 tests)
C45641L..Y (14 tests)	C46012L..Z (15 tests)

C24113H..K (4 tests) contain lines exceeding the implementation limit of 120 characters per line.

The following 20 tests check for the predefined type LONG_INTEGER; for this implementation, there is no such type:

C35404C	C45231C	C45304C	C45411C	C45412C
C45502C	C45503C	C45504C	C45504F	C45611C
C45613C	C45614C	C45631C	C45632C	B52004D
C55B07A	B55B09C	B86001W	C86006C	CD7101F

C35404D, C45231D, B86001X, C86006E, and CD7101G check for a predefined integer type with a name other than INTEGER, LONG_INTEGER, or SHORT_INTEGER; for this implementation, there is no such type.

C35713B, C45423B B86001T, and C86006H check for the predefined type SHORT_FLOAT; for this implementation, there is no such type.

C35713D and B86001Z check for a predefined floating-point type with a name other than FLOAT, LONG_FLOAT, or SHORT_FLOAT; for this implementation, there is no such type.

A35801E checks that FLOAT'FIRST..FLOAT'LAST may be used as a range constraint in a floating-point type declaration; for this implementation, that range exceeds the range of safe numbers of the largest predefined floating-point type and must be rejected. (See section 2.3.)

C45531M..P and C45532M..P (8 tests) check fixed-point operations for types that require a SYSTEM.MAX_MANTISSA of 47 or greater; for this implementation, MAX_MANTISSA is less than 47.

C45536A, C46013B, C46031B, C46033B, and C46034B contain length clauses that specify values for 'SMALL that are not powers of two or ten; this implementation does not support such values for 'SMALL.

C45624A..B (2 tests) check that the proper exception is raised if MACHINE_OVERFLOWS is FALSE for floating point types and the results of various floating-point operations lie outside the range of the base type; for this implementation, MACHINE_OVERFLOWS is TRUE.

D64005F..G (2 tests) use 10 levels of recursive procedure calls nesting; this level of nesting for procedure calls exceeds the capacity of the compiler.

B86001Y uses the name of a predefined fixed-point type other than type DURATION; for this implementation, there is no such type.

B91001H checks that an address clause for a task entry must not precede any entry; this implementation does not support interrupts. (See section 2.3.)

LA3004A..B, EA3004C..D, and CA3004E..F (6 tests) check pragma INLINE for procedures and functions; this implementation does not support pragma INLINE.

CD1009C checks whether a length clause can specify a non-default size for a floating-point type; this implementation does not support such sizes.

CD2A53A checks operations of a fixed-point type for which a length clause specifies a power-of-ten TYPE'SMALL; this implementation does not support decimal 'SMALLs. (See section 2.3.)

CD2A84A, CD2A84E, CD2A84I..J (2 tests), and CD2A84O use length clauses to specify non-default sizes for access types; this implementation does not support such sizes.

AE2101C and EE2201D..E (2 tests) use instantiations of package SEQUENTIAL_IO with unconstrained array types and record types with discriminants without defaults; these instantiations are rejected by this compiler.

AE2101H, EE2401D, and EE2401G use instantiations of package DIRECT_IO with unconstrained array types and record types with discriminants without defaults; these instantiations are rejected by this compiler.

The tests listed in the following table check that USE_ERROR is raised if the given file operations are not supported for the given combination of mode and access method; this implementation supports these operations.

Test	File Operation	Mode	File Access Method
CE2102D	CREATE	IN_FILE	SEQUENTIAL_IO
CE2102E	CREATE	OUT_FILE	SEQUENTIAL_IO
CE2102F	CREATE	INOUT_FILE	DIRECT_IO
CE2102I	CREATE	IN_FILE	DIRECT_IO
CE2102J	CREATE	OUT_FILE	DIRECT_IO
CE2102N	OPEN	IN_FILE	SEQUENTIAL_IO
CE2102O	RESET	IN_FILE	SEQUENTIAL_IO
CE2102P	OPEN	OUT_FILE	SEQUENTIAL_IO
CE2102Q	RESET	OUT_FILE	SEQUENTIAL_IO

CE2102R	OPEN	INOUT_FILE	DIRECT_IO
CE2102S	RESET	INOUT_FILE	DIRECT_IO
CE2102T	OPEN	IN_FILE	DIRECT_IO
CE2102U	RESET	IN_FILE	DIRECT_IO
CE2102V	OPEN	OUT_FILE	DIRECT_IO
CE2102W	RESET	OUT_FILE	DIRECT_IO
CE3102E	CREATE	IN_FILE	TEXT_IO
CE3102F	RESET	Any Mode	TEXT_IO
CE3102G	DELETE	-------	TEXT_IO
CE3102I	CREATE	OUT_FILE	TEXT_IO
CE3102J	OPEN	IN_FILE	TEXT_IO
CE3102K	OPEN	OUT_FILE	TEXT_IO

The following 16 tests check operations on sequential, direct, and text files when multiple internal files are associated with the same external file and one or more are open for writing; USE_ERROR is raised when this association is attempted.

CE2107B..E	CE2107G..H	CE2107L	CD2110B	CE2110D
CE2111D	CE2111H	CE3111B	CE3111D..E	CE3114B
CE3115A				

CE2203A checks that WRITE raises USE_ERROR if the capacity of an external sequential file is exceeded; this implementation cannot restrict file capacity.

CE2403A checks that WRITE raises USE_ERROR if the capacity of an external direct file is exceeded; this implementation cannot restrict file capacity.

CE3304A checks that SET_LINE_LENGTH and SET_PAGE_LENGTH raise USE_ERROR if they specify an inappropriate value for the external file; there are no inappropriate values for this implementation.

CE3413B checks that PAGE raises LAYOUT_ERROR when the value of the page number exceeds COUNT'LAST; for this implementation, the value of COUNT'LAST is greater than 150000, making the checking of this objective impractical.

2.3 TEST MODIFICATIONS

Modifications (see section 1.3) were required for 1233 tests.

The following tests were split into two or more tests because this implementation did not report the violations of the Ada Standard in the way expected by the original tests.

B44004D B59001E B73004B BA1001A BC3017A

C34009D and C34009J were graded passed by Evaluation Modification as directed by the AVO. These tests check that 'SIZE for a composite type is greater than or equal to the sum of its components' 'SIZE values; but this issue is addressed by AI-00825, which has not been considered; there is not an obvious interpretation. This implementation represents array components whose length depends on a discriminant with a default value by implicit pointers into the heap space; thus, the 'SIZE of such a record type might be less than the sum of its components 'SIZEs, since the size of the heap space that is used by the varying-length array components is not counted as part of the 'SIZE of the record type. These tests were graded passed given that the Report.Result output was "FAILED" and the only Report.Failed output was "INCORRECT 'BASE'SIZE", from line 195 of C34009D and line 193 in C34009J.

A35801E was graded inapplicable by Evaluation Modification as directed by the AVO. The compiler rejects the use of the range FLOAT'FIRST..FLOAT'LAST as the range constraint of a floating-point type declaration because the bounds lie outside of the range of safe numbers (cf. LRM 3.5.7:12).

C83030C and C86007A were graded passed by Test Modification as directed by the AVO. These tests were modified by inserting "PRAGMA ELABORATE (REPORT);" before the package declarations at lines 13 and 11, respectively. Without the pragma, the packages may be elaborated prior to package Report's body, and thus the packages' calls to function REPORT.IDENT_INT at lines 14 and 13, respectively, will raise PROGRAM_ERROR.

B91001H was graded inapplicable by Evaluation Modification as directed by the AVO. This test checks that an address clause for an entry cannot precede that or any other entry of the task. This implementation does not support interrupts, and so rejects any address clause for an entry, regardless of placement.

The tests below were graded passed by Test Modification as directed by the AVO. These tests all use one of the generic support procedures, Length_Check or Enum_Check (in support files LENCHECK.ADA & ENUMCHEK.ADA), which use the generic procedure Unchecked_Conversion. This implementation rejects instantiations of Unchecked_Conversion with array types that have non-static index ranges. The AVO ruled that since this issue was not addressed by AI-00590, which addresses required support for Unchecked_Conversion, and since AI-00590 is considered not binding under ACVC 1.11, the support procedures could be modified to remove the use of Unchecked_Conversion. Lines 40..43, 50, and 56..58 in LENCHECK and lines 42, 43, and 58..63 in ENUMCHEK were commented out.

CD1009A	CD1009I	CD1009M	CD1009V	CD1009W	CD1C03A
CD1C04D	CD2A21A..C	CD2A22J	CD2A23A..B	CD2A24A	CD2A31A..C
*CD2A81A	CD3014C	CD3014F	CD3015C	CD3015E..F	CD3015H
CD3015K	CD3022A	CD4061A			

*CD2A81A, CD2A81B, CD2A81E, CD2A83A, CD2A83B, CD2A83C, and CD2A83E were graded passed by Test Modification as directed by the AVO. These tests check that operations of an access type are not affected if a 'SIZE clause is given for the type; but the standard customization of the ACVC allows only a single size for access types. This implementation uses a larger size for access types whose designated object is of type STRING. The tests were modified by incrementing the specified size $ACC_SIZE with '+ 64'.

Many of the Class A and Class C (executable) test files were combined into single procedures ("bundles") by the AVF, according to information supplied by the customer and guidance from the AVO. This bundling was done in order to reduce the processing time--compiling, linking, and downloading to the target. For each test that was bundled, its context clauses for packages Report and (if present) SYSTEM were commented out, and the modified test was inserted into the declarative part of a block statement in the bundle. The general structure of each bundle was:

```
WITH REPORT, TEXT_IO, SYSTEM;
PROCEDURE <BUNDLE_NAME> IS

-- repeated for each test

   DECLARE
        <TEST FILE>     [a modified test is inserted here, ...]
   BEGIN
        <TEST NAME>;    [... and invoked here]

   EXCEPTION       --test is not expected to reach this exception handler
        WHEN OTHERS => REPORT.FAILED("unhandled exception  ");
                       REPORT.RESULT;
   END;
   TEXT_IO.NEW_LINE;

--         [... repeated for each test in the bundle]

TEXT_IO.PUT_LINE ("GROUP TEST <BUNDLE_NAME> COMPLETED");
END <BUNDLE_NAME>;
```

The 1189 tests that were processed in bundles are listed below; each bundle is delimited by '<' and '>'.

<A21001A	A22002A	A22006B	A26004A	A26007A	A27003A	A27004A
A29002A	A29002B	A29002C	A29002D	A29002E	A29002F	A29002G
A29002H	A29002I	A29002J	A29003A	A2A031A>	<A32203B	A32203C
A32203D	A33003A	A34017C	A35101B	A35402A	A35502Q	A35502R
A35710A	A35801A	A35801B	A35801F	A35902C	A38106D	A38106E
A38199A	A39005B	A39005C	A39005D	A39005E	A39005F>	<A39005G
A54B01A	A54B02A	A55B12A	A55B13A	A55B14A	A62006D	A71002A
A71004A	A72001A	A73001I	A73001J	A74105B	A74106A	A74106B
A74106C	A74205E	A74205F>	<A83009A	A83009B	A83041B	A83041C
A83041D	A83A02A	A83A02B	A83A06A	A83A08A	A83C01C	A83C01D

A83C01E A83C01F A83C01G A83C01H A83C01I A83C01J A85007D
A85013B A87B59A> <AB7006A AC1015B AC3106A AC3206A AC3207A>
<AD1A01A AD1A01B AD1D01E AD7001B AD7005A AD7101A AD7101C
AD7102A AD7103A AD7103C> <AD7104A AD7203B AD7205B> <C23001A
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<C26008A C27001A C2A001A C2A001B C2A001C C2A002A C2A006A
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C34009F C34009G C34009L C34011B C34012A C34014A C34014C>
<C34014E C34014G C34014H C34014J C34014L C34014N C34014P
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IMPLEMENTATION DEPENDENCIES

* This test listed in two explanations

CHAPTER 3

PROCESSING INFORMATION

3.1 TESTING ENVIRONMENT

The Ada implementation tested in this validation effort is described adequately by the information given in the initial pages of this report. For technical and sales information about this Ada implementation, contact:

Terry L. Dunbar
TLD Systems, Ltd.
3625 Del Amo Blvd.
Suite 100
Torrance, CA 90503

Testing of this Ada implementation was conducted at the customer's site by a validation team from the AVF.

3.2 SUMMARY OF TEST RESULTS

An Ada Implementation passes a given ACVC version if it processes each test of the customized test suite in accordance with the Ada Programming Language Standard, whether the test is applicable or inapplicable; otherwise, the Ada Implementation fails the ACVC [Pro90].

For all processed tests (inapplicable and applicable), a result was obtained that conforms to the Ada Programming Language Standard.

The list of items below gives the number of ACVC tests in various categories. All tests were processed, except those that were withdrawn because of test errors (item b; see section 2.1), those that require a floating-point precision that exceeds the implementation's maximum precision (item e; see section 2.2), and those that depend on the support of a file system -- if none is supported (item d). All tests passed, except those that are listed in sections 2.1 and 2.2 (counted in items b and f, below).

a) Total Number of Applicable Tests	3760	
b) Total Number of Withdrawn Tests	95	
c) Processed Inapplicable Tests	114	
d) Non-Processed I/O Tests	0	
e) Non-Processed Floating-Point Precision Tests	201	
f) Total Number of Inapplicable Tests	315	(c+d+e)
g) Total Number of Tests for ACVC 1.11	4170	(a+b+f)

3.3 TEST EXECUTION

A magnetic tape containing the customized test suite (see section 1.3) was taken on-site by the validation team for processing. The tests were grouped in bundles for more efficient processing. The contents of the magnetic tape were initially loaded on the Sun-4, and moved to the Data General MV/32 20000-2 using Ethernet.

After the test files were loaded onto the host computer, the full set of tests was processed by the Ada implementation.

The tests were compiled and linked on the host computer system, as appropriate. The executable images were transferred to the target computer system by the communications link described above, and run. The results were captured on the host computer system.

Testing was performed using command scripts provided by the customer and reviewed by the validation team. See Appendix B for a complete listing of the processing options for this implementation. It also indicates the default options. The options invoked explicitly for validation testing during this test were:

Options | Switch	Effect
No_Phase	Suppress displaying of phase times during compilation

All tests were executed with the Code Straightening, Global Optimizations, and automatic Inlining options enabled. Where optimizations are detected by the optimizer that represent deletion of test code resulting from unreachable paths, deleteable assignments, or relational tautologies or contradictions, such optimizations are reflected by informational or warning diagnostics in the compilation listings.

Test output, compiler and linker listings, and job logs were captured on magnetic tape and archived at the AVF. The listings examined on-site by the validation team were also archived.

APPENDIX A

MACRO PARAMETERS

This appendix contains the macro parameters used for customizing the ACVC. The meaning and purpose of these parameters are explained in [UG89]. The parameter values are presented in two tables. The first table lists the values that are defined in terms of the maximum input-line length, which is the value for $MAX_IN_LEN—also listed here. These values are expressed here as Ada string aggregates, where "V" represents the maximum input-line length.

Macro Parameter	Macro Value
$MAX_IN_LEN	120 -- Value of V
$BIG_ID1	(1..V-1 => 'A', V => '1')
$BIG_ID2	(1..V-1 => 'A', V => '2')
$BIG_ID3	(1..V/2 => 'A') & '3' & (1..V-1-V/2 => 'A')
$BIG_ID4	(1..V/2 => 'A') & '4' & (1..V-1-V/2 => 'A')
$BIG_INT_LIT	(1..V-3 => '0') & "298"
$BIG_REAL_LIT	(1..V-5 => '0') & "690.0"
$BIG_STRING1	'"' & (1..V/2 => 'A') & '"'
$BIG_STRING2	'"' & (1..V-1-V/2 => 'A') & '1' & '"'
$BLANKS	(1..V-20 => ' ')
$MAX_LEN_INT_BASED_LITERAL	"2:" & (1..V-5 => '0') & "11:"
$MAX_LEN_REAL_BASED_LITERAL	"16:" & (1..V-7 => '0') & "F.E:"

```
$MAX_STRING_LITERAL    '"' & (1..V-2 => 'A') & '"'
```

The following table lists all of the other macro parameters and their respective values.

Macro Parameter	Macro Value
$ACC_SIZE	32
$ALIGNMENT	4
$COUNT_LAST	2147483647
$DEFAULT_MEM_SIZE	16#10000000#
$DEFAULT_STOR_UNIT	16
$DEFAULT_SYS_NAME	DGMV
$DELTA_DOC	2.0**(-31)
$ENTRY_ADDRESS	15
$ENTRY_ADDRESS1	17
$ENTRY_ADDRESS2	19
$FIELD_LAST	127
$FILE_TERMINATOR	ASCII.EDT
$FIXED_NAME	NO_SUCH_FIXED_TYPE
$FLOAT_NAME	NO_SUCH_FLOAT_TYPE
$FORM_STRING	""
$FORM_STRING2	"CANNOT_RESTRICT_FILE_CAPACITY"
$GREATER_THAN_DURATION	90000.0
$GREATER_THAN_DURATION_BASE_LAST	131073.0
$GREATER_THAN_FLOAT_BASE_LAST	2.0E+76
$GREATER_THAN_FLOAT_SAFE_LARGE	2.0E+75

```
$GREATER_THAN_SHORT_FLOAT_SAFE_LARGE
                        NO_SUCH_SHORT_FLOAT_TYPE

$HIGH_PRIORITY          200

$ILLEGAL_EXTERNAL_FILE_NAME1
                        BADFILENAME@.!

$ILLEGAL_EXTERNAL_FILE_NAME2
          THISFILENAMEWOULDBEPERFECTLYLEGALIFITWERENOTSOLONG.SOTHERE

$INAPPROPRIATE_LINE_LENGTH
                        -1

$INAPPROPRIATE_PAGE_LENGTH
                        -1

$INCLUDE_PRAGMA1        PRAGMA INCLUDE ("A28006D1.TST")

$INCLUDE_PRAGMA2        PRAGMA INCLUDE ("B28006E1.TST")

$INTEGER_FIRST          -2147483648

$INTEGER_LAST           2147483647

$INTEGER_LAST_PLUS_1    2147483648

$INTERFACE_LANGUAGE     ASSEMBLY

$LESS_THAN_DURATION     -90000.0

$LESS_THAN_DURATION_BASE_FIRST
                        -131073.0

$LINE_TERMINATOR        ASCII.CR

$LOW_PRIORITY           1

$MACHINE_CODE_STATEMENT
                        AC2'(OP=>1,ACS=>0,ACD=>2,OP2=>WMOV);

$MACHINE_CODE_TYPE      ACCUMULATOR

$MANTISSA_DOC           31

$MAX_DIGITS             15

$MAX_INT                2147483647

$MAX_INT_PLUS_1         2147483648

$MIN_INT                -2147483648

$NAME                   NO_SUCH_INTEGER_TYPE
```

$NAME_LIST	Af1750, DgMv
$NAME_SPECIFICATION1	X2120A
$NAME_SPECIFICATION2	X2120B
$NAME_SPECIFICATION3	X3119A
$NEG_BASED_INT	16#FFFFFFFE#
$NEW_MEM_SIZE	16#10000000#
$NEW_STOR_UNIT	16
$NEW_SYS_NAME	AF1750
$PAGE_TERMINATOR	ASCII.FF
$RECORD_DEFINITION	type Nullary is record Opcode : Nullary_Op; end record;
$RECORD_NAME	NULLARY
$TASK_SIZE	32
$TASK_STORAGE_SIZE	2000
$TICK	0.001
$VARIABLE_ADDRESS	8#16000000200#
$VARIABLE_ADDRESS1	8#16000000220#
$VARIABLE_ADDRESS2	8#16000000240#
$YOUR_PRAGMA	pragma export

APPENDIX B

COMPILATION SYSTEM OPTIONS

The compiler options of this Ada implementation, as described in this Appendix, are provided by the customer. Unless specifically noted otherwise, references in this appendix are to compiler documentation and not to this report.

LINKER OPTIONS

The linker options of this Ada implementation, as described in this Appendix, are provided by the customer. Unless specifically noted otherwise, references in this appendix are to linker documentation and not to this report.

To delete default options:

```
TLD_DEFAULTS DELETE
```

3.4 Compiler Option Switches

Compiler option switches provide control over various processing and output features of the compiler. These features include several varieties of listing output, the level and kinds of optimizations desired, the choice of target computer, and the operation of the compiler in a syntax checking mode only.

Keywords are used for selecting various compiler options. The complement keyword, if it exists, is used to disable a compiler option and is formed by prefixing the switch keyword with "NO_".

Switches may be abbreviated to the number of characters required to uniquely identify the switch. For example, the switch "CROSSREF" (explained in the list below) may be uniquely identified by the abbreviation "CR" or any longer abbreviation. In the list of switches, on the following pages, the abbreviations are in bold, the optional extra characters are not bolded.

If an option is not specified by the user, a default setting is assumed. All specified compiler options apply to a single invocation of the compiler.

The default setting of a switch and its meaning are defined in the table below. The meaning of the complement form of a switch is normally the negation of the switch. For some switches, the complement meaning is not obvious; these complement switch keywords are listed separately.

In the description of the switches, the target dependent name *target* is used. The value of this symbol is determined by the value of the TARGET switch.

Compiler generated file specifications generally conform to host conventions. Thus, any generated filename is the source filename appended with the default-file extension. If the user specifies a full output filename, no default extension is provided.

SWITCH NAME **MEANING**

CALL_TREE
NO_CALL_TREE -- default

This switch is used in conjunction with /ELABORATE and /LIST to cause all .CTI files (corresponding to the complete set of object files being linked for this program) to be read in and a closure of all calls in the program to be computed. The results of this analysis is formatted into a subprogram call tree report.

Note: The call tree will be incomplete if any required compilation unit's .CTI files are missing.

CHECKS -- default
CHECKS(=*check_identifier*(,...))
NO_CHECKS(=*check_identifier*(,...))

When the CHECKS switch is used, one or more check_identifiers are specified and the specified run time checks are enabled. The status of run time checks associated with unmentioned check_identifiers is unchanged.

Without any check_identifiers, the NO_CHECKS switch omits all run time checks. If one or more check_identifiers are specified, the specified run time checks are omitted. The status of run time checks associated with unmentioned check_identifiers is unchanged.

Checks can be eliminated selectively or completely by source statement pragma Suppress. Pragma Suppress overrides the checks switch.

Check_identifiers are listed below and are described in the LRM, Section 11.7.

ACCESS_CHECK	DISCRIMINANT_CHECK	DIVISION_CHECK
ELABORATION_CHECK	INDEX_CHECK	LENGTH_CHECK
OVERFLOW_CHECK	RANGE_CHECK	STORAGE_CHECK

ADE Related Switch: /SUPPRESS

CONFIG=*value*
NOCONFIG=*value*

The CONFIG switch provides a conditional compilation (configuration) capability by determining whether or not source text, introduced or bracketed by special comment constructs, is compiled. For a single line:

```
--/value    source-text
```

where source-text is compiled only if config = value is specified.

For multiple lines:

```
--/value    line-1
--/value    line-2
--/value    line-3
    .          .
    .          .
    .          .
--/value    line n
```

where the construct

```
--{value    line-1
            line-2
            line-3
    .          .
    .          .
    .          .
--}value    line-n
```

is equivalent.

NOTE: The braces ({ and }) must appear in the source code; in this instance, they are not metacharacters. All of the text between --{value and --}value is compiled or skipped, depending upon whether or not the /config=value is present.

CPL

This switch sets the number of characters per line (80 to 132) in the listing file.

CROSSREF
NO_CROSSREF -- default

This switch generates a cross reference listing that contains names referenced in the source code. The cross reference listing is included in the listing file; therefore, the LIST switch must be selected or CROSSREF has no effect.
ADE Related Command: PRETTY/CREF

CTI *(=CTI-file-spec)*
NO_CTI -- default

This switch generates a CASE tools interface file. The default filename is derived from the object filename, with a .CTI extension. This switch is required to support the Stack Analysis and/or Call Tree switches.

DEBUG -- default
NO_DEBUG

This switch selects the production of symbolic debug tables in the relocatable object file.

Alternate abbreviation: **DBG**, **NO_DBG**
ADE Related Switch: /DEBUG, /TABLE

DELASSIGN -- default
NO_DELASSIGN

This switch optimizes code by deleting redundant assignments.

NOTE: Use of this switch can cause erroneous source programs to execute with unexpected results if references to access objects are made without regard to the interference semantics of Ada.

ELABORATOR

This switch selects generation of a setup program that elaborates all compilation units on which the named subprogram depends and then calls the named program. This program will be the main program at link time.

EXCEPTION_INFO
NO_EXCEPTION_INFO -- default

This switch generates a string in the relocatable object code that is the full pathname of the file being compiled. It generates extra instructions to identify the location at which an unhandled exception occurred. The NO_EXCEPTION_INFO switch suppresses the generation of the string and extra instructions. The source statement pragma Suppress (ALL_CHECKS) or pragma Suppress (EXCEPTION_INFORMATION) suppresses only the extra instructions.

FULL_CALL_TREE -- default

When the FULL_CALL_TREE switch is used, the compiler listing includes representations of every call.

INDENT-*n*
INDENT-3 -- default
NO_INDENT

This switch produces a formatted (indented) source listing. This switch assigns a value to the number of columns used in indentation; the value n can range from 0 to 15.

INFO -- default
NO_INFO

This switch produces all diagnostic messages. It suppresses the production of information-level diagnostic messages.

INLINE -- default
NO_INLINE

This default switch automatically inlines any procedure that is called only once. It may be disabled by adding the noinline option to the command line. Inlining is only implemented for calls that are made within the same compilation unit as the body of the procedure to be expanded.

INTSL
NO_INTSL -- default

This switch intersperses lines of source code with the assembly code generated in the macro listing. This switch is valid only if the LIST, SOURCE, and MACRO switches are selected.
ADE Related Switch: /ASSEMBLY

INVERTED_CALLS

This switch is used to determine which calls led to the present one. A reversed order call tree is generated.

LIBRARY=*Ada-program-library-file-spec*
LIBRARY=*target*.LIB -- default

The LIBRARY switch specifies the file to be used for Ada Program Library. The default value of *target* in the Ada Program Library file spec is derived from the TARGET switch.
ADE Related Switch: /LIBRARY

LIST[=*listing-file-spec*]
NO_LIST -- default

The LIST switch generates a listing file. The default file extension is LST. The *listing-file-spec* can be optionally specified.

LOG
NO_LOG -- default

This switch requests the compiler to write a compiler log, including command line options and the file spec of the Ada source file being compiled, to @OUTPUT.

LPP=60 -- default

The LPP switch assigns a value to the number of lines per page for listing. The value can range from 10 to 99.

MACRO
NO_MACRO -- default

The MACRO switch produces an assembly like object code listing appended to the source listing file. The LIST switch must be enabled for this switch to work.

MAIN_ELAB
NOMAIN_ELAB -- default

The MAIN_ELAB switch is used to inform the compiler that the compilation unit being compiled is to be treated as a user-defined elaboration, or setup, program.

Note: The XTRA switch is required when MAIN_ELAB is to be used.

MAKELIB(=*parent-APL-spec*)
NO_MAKELIB -- default

The MAKELIB switch creates a new Ada Program Library (APL) file. MAKELIB should be used with caution because it creates a new APL file in the default directory even if another APL file of the same name existed.

The new APL file is created in the current working directory with the name *target*.LIB unless the LIBRARY switch is used.

If MAKELIB is used without a parent, a new library is created with the default RTS specification. This specification is derived from the name TLD_LIB_*target*. See the target dependent compiler sections for further explanations of this name.
ADE Related Commands: LIBCREATE, LIBSEARCHLIST

MAXERRORS=*n*
MAXERRORS=500 -- default

This switch assigns a value limit to the number of errors forcing job termination. Once this value is exceeded, the compilation is terminated. Information-level diagnostic messages are not included in the count of errors forcing termination. The specified value's range is from 0 to 500.

MODEL=MATH -- MV target
MODEL=MATH -- MV target

By default, the compiler produces code for the generic or standard target. The model switch allows the user to specify a nonstandard model for the target.

For the MV-HAWK target, the MODEL switch may be set to MATH to indicate that code generation should take advantage of the intrinsic math instructions.

NEG_OFFSET

The NEG_OFFSET switch is used to get around a deficiency in the MV linker. Negative offsets can cause a "relocation overflow" error if this option is not used.

OBJECT=(*object-file-spec*)
OBJECT -- default
NO_OBJECT

The OBJECT switch produces a relocatable object file. The default file extension is ".OBJ".

OPT -- default
NO_OPT

The OPT switch enables global optimization of the compiled code.

PARM
NO_PARM -- default

The PARM switch causes all option switches governing the compilation, including the defaulted option switches, to be included in the listing file. The LIST option must also be selected or PARM will have no effect. User specified switches are preceded in the listing file by a leading asterisk (*).

PHASE -- default
NO_PHASE

The NO_PHASE switch suppresses the display of phase names during compilation.

REF_ID_Case=*option*

The Ref_Id_Case switch is used to determine how variable names appear in the compiler listing. The *options* for this switch are:

All_Lower	--	All variable names are in lower case.
All_Underlined	--	All variable names are underlined.
All_Upper	--	All variable names are in upper case.
As_Is	--	All variable names appear as is.
Initial_Caps	--	All variable names have initial caps.
Insert_Underscore	--	All variable names have underscores inserted.

REF_KEY_Case=*option*

The Ref_Key_Case switch is used to determine how Ada key words appear in the compiler listing. The *options* for this switch are:

All_Lower	--	All Ada key words are in lower case.
All_Underlined	--	All Ada key words are underlined.
All_Upper	--	All Ada key words are in upper case.
As_Is	--	All Ada key words appear as is.
Initial_Caps	--	All Ada key words have initial caps.
Insert_Underscore	--	All Ada key words have underscores inserted.

REFORMAT(=*reformat-file-spec*)
NO_REFORMAT -- default

This switch causes TLDada to reformat the source listing in the listing file and, if a *reformat-file-spec* is present, to generate a reformatted source file. The default extension of the new source file is ".RFM".
ADE Related Command: PRETTY

SOURCE -- default
NO_SOURCE

This switch causes the input source program to be included in the listing file. Unless they are suppressed, diagnostic messages are always included in the listing file.

ADE Related Switch: /ERRORS

STACK_ANALYSIS
NO_STACK_ANALYSIS -- default

This switch is used with the ELABORATOR switch to cause all CTI files (corresponding to the complete set of object files being linked for this program) to be read in. The subprogram call tree is analyzed to compute stack requirements for the main program and each dependent task.

NOTE: The tree will be incomplete if any required compilation unit's CTI files are missing.

SYNTAX_ONLY
NO_SYNTAX_ONLY -- default

This switch performs syntax and semantic checking on the source program. No object file is produced and the MACRO switch is ignored. The Ada Program Library is not updated.

TARGET=MV -- default
TARGET=HAWK

This switch selects the target computer for which code is to be generated for this compilation. "HAWK" selects the Rolm HAWK architecture running under AOS/VS or ARTS/32. "MV" selects the Eclipse MV architecture operating under AOS/VS, AOS/VS II, or RT/32.

WARNINGS -- default
NO_WARNINGS

The WARNINGS switch outputs warning and higher-level diagnostic messages.

The NO_WARNINGS switch suppresses the output of both warning-level and information-level diagnostic messages.

WRITE_ELAB
NO_WRITE_ELAB -- default

The WRITE_ELAB switch is used to obtain an Ada source file which represents the main elaboration "setup" program created by the compiler. The MAIN_ELAB switch may not be used at the same time as the ELAB switch.

XTRA
NO_XTRA -- default

This switch is used to access features under development. See the description of this switch in Section 3.9.

APPENDIX C

APPENDIX F OF THE Ada STANDARD

The only allowed implementation dependencies correspond to implementation-dependent pragmas, to certain machine-dependent conventions as mentioned in Chapter 13 of the Ada Standard, and to certain allowed restrictions on representation clauses. The implementation-dependent characteristics of this Ada implementation, as described in this Appendix, are provided by the customer. Unless specifically noted otherwise, references in this Appendix are to compiler documentation and not to this report. Implementation-specific portions of the package STANDARD, which are not a part of Appendix F, are:

```
package STANDARD is
    ..........

    type INTEGER is range -2147483648 .. 2147483647;

    type FLOAT is digits 6 range -2.26156E+74 .. 2.26156E+74;

    type DURATION is delta 2.0**(-12) range -86400.0 .. 86400.0;

    type SHORT_INTEGER is range -32768 .. 32767;

    type LONG_FLOAT is digits 15
         range -2.2615642491634E+74 .. 2.26156424291634E+74;

    ..........
end STANDARD;
```

APPENDIX F OF THE Ada STANDARD

In the customer's Appendix F documentation that constitutes this appendix, some information appears to be inaccurate or incomplete; the AVF offered the customer an opportunity to redress these points, but the customer declined to do so.

The customer declined to provide the AVF with an updated list of all compiler/linker options and the options used specifically for this validation.

The customer states that DURATION'DELTA = 2.0**(-12). Although other implementations have a value of 2.0**(-14) and therefore should possibly be 2.0**(-14). The customer declined to provide the AVF with an updated Appendix F for this implementation; therefore we cannot be certain as to the correct value.

The customer declined to provide an Appendix F containing a package SYSTEM specification.

On page C-4, the customer states several inaccuraties concerning length clauses being not supported for 'SIZE except when applied to task types and 'Storage_Size when applied to access types. Also length clauses are supported for 'Small. The customer declined to provide the AVF with an updated Appendix F for this implementation.

The Ada language definition allows for certain machine dependencies in a controlled manner. No machine-dependent syntax of semantic extensions or restrictions are allowed. The only allowed implementation-dependencies correspond to implementation-dependent pragmas and attributes, certain machine-dependent conventions as mentioned in chapter 13 of the MIL-STD-1815A; and certain allowed restrictions on representation clauses.

The full definition of the implementation-dependent characteristics of the TLD MV/MV Ada Compiler System is presented in this Appendix F.

Implementation-Dependent Pragmas

The TLD ACS supports the following implementation dependent pragmas.

Pragma Export (Language_name, Ada_entity_name, [String]);

This pragma is a complement to Pragma Interface and instructs the compiler to make the entity named available for reference by a foreign language module. The language name identifies the language in which the foreign module is coded. The only foreign language presently supported is Assembly. Ada and JOVIAL are permitted and presently mean the same as Assembly but the semantics of their use are subject to redefinition by future releases of the compiler. If the optional third parameter is present, the string provides the name by which the entity may be referenced by the foreign module. The contents of this string must conform to the conventions for the indicated foreign language and the linker being used. No check is made by the compiler to insure that these conventions are obeyed.

Only objects having static allocation and subprograms are supported by pragma Export. If the Ada entity named is a subprogram, this pragma must be placed within the declarative region of the named subprogram. If the name is that of an object, the pragma must be placed within the same declarative region and following the object declaration. It is the responsibility of the programmer to insure that the subprogram and object are elaborated before the reference is made.

```
pragma If (Compile_Time_Expression);
pragma Elsif (Compile_Time_Expression);
pragma Else;
pragma Endif;
```

These Source directives may be used to enclose conditionally compiled source to enhance program portability and configuration adaptation. These directives may occur at the place that language defined pragmas, statements, or declarations may occur. Source code following these pragmas will be compiled or ignored similar to the semantics of the corresponding Ada statements depending upon whether the Compile_Time_Expression is true

or false, respectively. The primary difference between these pragmas and the corresponding Ada Statements are that the pragmas may enclose declarations and other pragmas.

Implementation-Dependent Attributes

None.

Representation Clause Restrictions

Pragma Pack is not supported.

Length clauses are not supported for 'SIZE except when applied to task types.

Length clauses are not supported for 'Storage_Size when applied to access types.

Length clauses are not supported for 'Storage_Size when applied to a task type and denote the number of words of stack to be allocated to the task.

Length clauses are not supported for 'Small.

Enumeration representation clauses are supported for value ranges of Integer'First to Integer'Last.

Record representation clauses are supported to arrange record components within a record. Record components may not be specified to cross a word boundary unless they are arranged to encompass two or more whole words. A record component of type record that has itself been "rep specificationed" may only be allocated at bit 0. Bits are numbered from left to right with bit 0 indicating the sign bit.

The alignment clause is not supported.

Address clauses are supported for variable objects and designate the virtual address of the object. The TLD Ada Compiler System treats the address specification as a means to access objects allocated by other than Ada means and accordingly does not treat the clause as a request to allocate the object at the indicated address.

Address clauses are not supported for constant objects, packages, tasks. or task entries.

Implementation-Generated Names

The TLD Ada Compiler System defines no implementation dependent names for compiler generated components.

Address Clause Expressions

Address expression values and type Address represent a location in logical memory (in the program's current address space). For objects, the address specifies a location within the logical address space. The 'Address attribute applied to a subprogram represents a 32 bit word address within the logical instruction space.

Unchecked Conversion Restrictions

None.

I/O Package Characteristics

The following implementation-defined types are declared in Text_Io.

```
subtype Count is integer range 0 .. 2_147_483_647;

subtype Field is integer range 0 .. 127;
```

Other System Dependencies

LRM Chapter 1.

None.

LRM Chapter 2.

Maximum source line length — 120 characters.

Source line terminator — Determined by the Editor used.

Maximum name length — 120 characters.

External representation of name characters.

Maximum String literal — 120 characters.

LRM Chapter 3.

LRM defined pragmas are recognized and processed as follows:

Controlled — Has no effect.

Elaborate — As described in the LRM.

Inline — Not presently supported.

Interface -- Supported as a means of importing foreign language components into the Ada Program Library. May be applied either to a subprogram declaration as being specially implemented, -- read Interface as Import --, or to an object that has been declared elsewhere. Interface languages supported are Assembly for calling assembly language routines; and MV 32 for defining built in instruction procedures. An optional third parameter is used to define a name other than the name of the Ada subprogram for interfacing with the linker.

List -- As defined in the LRM.

Memory Size -- Has no effect.

Optimize -- Has no effect. Optimization controlled by compiler command option.

Pack -- Has no effect.

Page -- As defined in the LRM.

Priority -- As defined in the LRM. Priority may range from 1 to 200. Default priority is 1.

Shared -- As defined in the LRM. May be applied to scalar objects only.

Storage Unit -- Has no effect.

Suppress -- As defined in the LRM for suppressing checks; all standard checks may be suppressed individually as well as "Exception_Info" and "All_Checks". Suppression of Exception_Info eliminates data used to provide symbolic debug information in the event of an unhandled exception. The All_Checks selection eliminates all checks with a single pragma. In addition to the pragma, the compiler permits control of check suppression by command line option without the necessity of source changes.

System Name -- Has no effect.

Number declarations are not assigned addresses and their names are not permitted as a prefix to the 'address attribute. (Clarification only).

Objects are allocated by the compiler to occupy one or more 16 bit words. Only in the presence record representation clauses are objects allocated to less than a word.

Except for access objects, uninitialized objects contain an undefined value. An attempt to reference the value of an uninitialized object is not detected.

The maximum number of enumeration literals of all types is limited only by

available symbol table space.

The predefined integer types are:

```
Short_Integer range -32_768 .. 32_767 and is implemented as a 16 bit
value.
Integer range -2_147_483_648 .. 2_147_483_647 and implemented a 32 bit
value.
Long_Integer is not supported.
System.Min_Int is -2_147_483_648.
System.Max_Int is 2_147_483_647.
```

The predefined real types are:

```
Float digits 6.
Long_Float digits 15.
Short_Float is not presently supported.
System.Max_Digits is 15 digits.
```

Fixed point is implemented as 16-bit or 32-bit data as is appropriate for the range and delta.

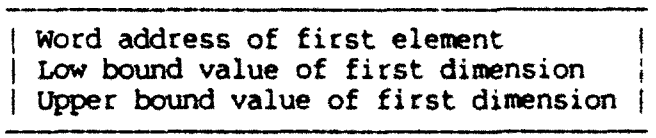
Index constraints as well as other address values such as access types are limited to 29 bits of value.

The maximum array size is limited to the size of virtual address.

The maximum String length is the same as for other arrays.

Access objects are implemented as an unsigned 32 bit integer. The access literal Null is implemented as two words of zero.

There is no limit on the number of dimensions of an array type. Array types are passed as parameters opposite unconstrained formal parameters using a 3 word dope vector illustrated below:



Additional dimension bounds follow immediately for arrays with more chan one dimension.

LRM Chapter 4.

Machine_Overflows is True.

Pragma Controlled has no effect since garbage collection is never performed.

LRM Chapter 5.

The maximum number of statements in an Ada source program is undefined and limited only by the Symbol Table space.

Case statements unless they are quite sparse, are allowed as indexed jump vectors and are, therefore, quite fast.

Loop statements with a for implementation scheme are implemented most efficiently if the range is in reverse and down to zero.

Data declared in block statements is elaborated as part of its containing scope.

LRM Chapter 6.

Arrays, records and task types are passed by reference.

Pragma Inline is not presently supported for subprograms.

LRM Chapter 7.

Package elaboration is performed dynamically permitting a warm restart without the necessity to reload the program.

LRM Chapter 8.

LRM Chapter 9.

Task objects are implemented as access types pointing to a Task Information Block (TIB).

Type Time in package Calendar is declared as a record containing two double precision integer values: the date in days and the real time clock.

Pragma Priority is supported with a value of 1 to 200.

Pragma Shared is supported for scalar objects.

LRM Chapter 10.

Multiple Ada Program Libraries are supported with each library containing an optional ancester library. The predefined packages are contained in the TLD standard library, MV.LIB.

LRM Chapter 11.

Exceptions are implemented by the TLD Ada Compiler System to take advantage of the normal policy in embedded computer system design to reserve 50% of

the duty cycle. By executing a small number of instructions in the prologue of a procedure or block containing an exception handler, a branch may be taken, at the occurance of an exception, directly to a handler rather than performing the time consuming code of unwinding procedure calls and stack frames. The philosophy taken is that an exception signals an exceptional condition, perhaps a serious one involving recovery or reconfiguration, and that quick response in this situation is more important and worth the small throughput tradeoff in a real time environment.

LRM Chapter 12.

A single generic instance is generated for a generic body. Generic specifications and bodies need not be compiled together nor need a body be compiled prior to the compilation of an instantiation. Because of the single expansion, this implementation of generics tend to be more favorable of space savings. To achieve this tradeoff, the instantiations must by nature be more general and are, therefore, somewhat less efficient timewise.

LRM Chapter 13.

Representation clause support and restrictions are defined above.

A comprehensive Machine_Code package is provided and supported.

Unchecked_Deallocation and Unchecked_Conversion are supported.

The implementation dependent attributes are all supported except 'Storage_Size for an access type.

LRM Chapter 14.

Full file I/O operations are supported and interface to AOS/VS operations. Text_Io and Low_Level_Io are supported.